



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/960,419	09/21/2001	Shoji Ikeda	0941.65839	5534

7590

03/07/2003

Patrick G. Burns, Esq.
GREER, BURNS & CRAIN, LTD.
Suite 2500
300 South Wacker Dr.
Chicago, IL 60606

EXAMINER

FALASCO, LOUIS V

ART UNIT

PAPER NUMBER

1773

DATE MAILED: 03/07/2003

3

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/960,419

Applicant(s)

IKEDA ET AL.

Examiner

Louis Falasco

Art Unit

1773

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☒ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____

Claims

- The claims are 1 to 20 all claims are under consideration

Papers Received

- Applicants' claim for priority under 35 UDSC 119 along with certified copy have been received
- Applicants' Information Disclosure Statement has been received
 - The Japanese patent publications in applicants' Information Disclosure Statement have been considered only to the extent of the attached English language abstract, and the explains in the instant disclosure.

Objections

1. The disclosure is objected to because of informalities in misspellings, an example of which is on page 4 line 7 where (sic) "resent" should be *recent*.

Applicant is requested to review the specification that may have resulted from a translation of an originally non-English language document. Appropriate correction is required.

Rejections

Statutory Basis - 35 USC 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 1773

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Action on claim merits

2. Claims 1 through 20 are rejected as being unpatentable under 35 U.S.C. 103 over the teachings of **Sasaki** (US 6210544).

Sasaki et al encompasses the required claimed Fe-Co-M-O composition of the thin film layer and the claimed recording head. The **Sasaki** film composition may have the element 'X' is at zero.

In **Sasaki et al** see the composition:

(Co_{1-(between 0 and .7)} Fe (i.e. "Q" is Fe) (between 0 and .7)) (balance) M(= to Al, Zr,

Ti, Hf, Mo, Si, W, B, Al, Ge, Ga or any Rare Earth) (between 3 and 30) O (between

7 and 40) X (at zero)

- note col. 3 lns 32 - 48, and ratios col. 7 26-51, col. 8 lns 44-54.

'X' is taught as zero in **Sasaki**, the selection of zero would have been obvious to one having ordinary skill in the art for the purpose of inducing soft magnetism to the head, is would have been desirable since the presence of 'X' at all is a matter of choice, offsetting the magnetism and other characteristics of the layer with corrosion resistance, in the magnetic heads of the instant claims 19 and 20 and a magnetically soft layer such

as flux densities, specific resistances and saturation magnetism (col. 5 lns 39-41, 52-59, and col. 6 lns 15-45).

Sasaki also teaches the required body centered cubic structure.

Note in **Sasaki** this body centered cubic structure preference - col. 5 lns 27-28; col. 9 lns 61-64; col. 17 lns 38-41 and **Sasaki** teaches adjusting the grain size within that of the instant claimed range - to less than 30 nm, see col. 3 lns 21-24.

As to claim 2: two kinds of element M may be used in the **Sasaki** compound - see col. 2 lns 53.

As to claims 3, 4, 8, and 10: anisotropy is controlled by the action of Co which may be adjusted as desired for increasing or decreasing the level of uniaxial magnetic anisotropy in **Sasaki** - see col. 5 lns 57-59. As to axis in claims 11, 12, 13 and 14 the specific size would have been a matter of routine optimization **Sasaki** shows this well with in the shorter than 50 nm size - see col. 5 lns 33-35.

As to claims 5 and 6: two kinds of element M may be used in the **Sasaki** compound - see col. 2 lns 53.

As to claims 15 and 16: the specific resistance can be adjusted by adjusting the amorphous phase of the alloy as required in **Sasaki** - see col. 5 lns 23-35 and see col. 9 lns 15-19 and col. 17 lns 5-10.

As to claims 17 to 20: the film is formed as a lamina in a magnetic head - col. 1 lns 8-24.

Art Unit: 1773

3. Claims 1 through 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Shigehiro et al** (JP 10270246 translated abstract submitted by applicants) taken with **Sasaki** (US 6210544).

It has been known to have Fe-Co-Al-O films. This is evident from **Shigehiro et al** JP noting the abstract submitted by applicants and admissions regarding **Shigehiro et al** JP appearing in the instant disclosure page- -5- lines 11, 12, 15, and 16.

In **Shigehiro et al** JP note the composition formula in the layer including:

$$\text{Co}_{100 - (\text{between } 10 \text{ and } 50) - (\text{between } 2 \text{ and } 10) - (\text{between } 6 \text{ and } 25)} \text{Fe}_{(\text{between } 1 \text{ and } 50)} \text{M} (= \text{to Al, Zr, Ti, Hf})_{(\text{between } 2 \text{ and } 10)} \text{O}_{(\text{between } 6 \text{ and } 20)} .$$

This **Shigehiro et al** JP composition appears¹ to encompass the thin film layer claimed of Fe-Co-Al-O composition - cf. the formula of which is specified as:

$$(\text{Co}_{(\text{between } .05 \text{ and } .65)} \text{Fe}_{1 - (\text{between } .05 \text{ and } .65)})_{100 - (\text{between } .2 \text{ and } 9 \text{ at\%} - \text{between } 1 \text{ to } 12 \text{ at\%})} \text{M}(= \text{to Al, Zr, Ti, Hf, Mg, or Be})_{(\text{between } .2 \text{ and } 9 \text{ at\%})} \text{O}_{(\text{equal or more than } 15 \text{ at\%})}$$

~ OR ~

$$\text{Co}_{(\text{between } 98 \text{ and } 85)} \text{Fe}_{(\text{between } 1 \text{ and } 50)} \text{M} (= \text{to Al, Zr, Ti, Hf})_{(\text{between } 2 \text{ and } 10)} \text{O}_{(\text{between } 6 \text{ and } 20)} .$$

However **Shigehiro et al** JP does not point out the crystalline structure to acquire the soft magnetic layer character nor does **Shigehiro et al** JP recite the claimed measures forming the soft magnetic layer and the soft magnetic layer in the recording head. **Sasaki**, while teaching a composition encompassing the required claimed Fe-Co-M-O composition² for the thin film layer and the claimed recording head, teaches the crystalline grain structure and size.

Art Unit: 1773

Sasaki shows that the grain size as less than 30 nm and the grain structure as body centered cubic.

In **Sasaki** see the composition:

(Co 1- (between 0 and .7) Fe (i.e. "Q" is Fe) (between 0 and .7)) (balance) M(= to Al, Zr, Ti, Hf, Mo, Si, W, B, Al, Ge, Ga or any Rare Earth) (between 3 and 30) O (between 7 and 40) X (at zero)

Note col. 3 lns 32 - 48, and ratios col. 7 26-51, col. 8 lns 44-54.

'X' would be zero, as taught within the ranges of **Sasaki**, the presence of 'X' is merely dependent on the desire to adjust corrosion resistance of the film - off balancing other desirable magnetic characteristics for the head, such as flux densities, specific resistances and saturation magnetism (col. 5 lns 39-41, 52-59, and col. 6 lns 15-45).

The worker having ordinary skill would have been motivated to select 'X' at zero in order to induce a soft magnetic character as is required in the magnetic head of instant claims 19 and 20; also note the *body centered cubic* structure in **Sasaki et al** - see col. 5 lns 27-28; col. col. 9 lns 61-64; col. 17 lns 38-41 - where the *body centered cubic* structure is the preferred structure.

Also note that **Sasaki** teaches the grain size must be made fine - in the range of less than 30 nm (see col. 3 lns 21-24), well within that of the instant claimed range.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to adopt the **Sasaki** size of less than 30 nm and structure of a *body centered cubic* grain for the purpose of improving the magnetic characteristics, including magnetic permeability, saturation flux, and selecting the formula for inducing

Art Unit: 1773

a soft magnetic character desired in a magnetic head (see **Sasaki** col. 1 lns 9-24), **Sasaki** being directed to a head with soft magnetic core layer.

One skilled in the art would have been motivated to adopt **Sasaki**, who teaches a soft magnetic composition like that of the instant claims to **Shigehiro et al** (JP) with the expectation of inducing a soft magnetic character with increased the flux density, high responsiveness of the recording media.

Sasaki also teaches the required body centered cubic structure.

Note in **Sasaki** this body centered cubic structure preference – col. 5 lns 27-28; col. col. 9 lns 61-64; col. 17 lns 38-41 and **Sasaki** teaches adjusting the grain size within that of the instant claimed range - to less than 30 nm, see col. 3 lns 21-24.

As to claim 2: two kinds of element M may be used in the **Sasaki** compound – see col. 2 lns ln 53.

As to claims 3, 4, 8, and 10: anisotropy is controlled by the action of Co which may be adjusted as desired for increasing or decreasing the level of uniaxial magnetic anisotropy in **Sasaki** – see col. 5 lns ln 57-59. As to axis in claims 11, 12, 13 and 14 the specific size would have been a matter of routine optimization **Sasaki** shows this well with in the shorter than 50 nm size – see col. 5 lns 33-35.

As to claims 5 and 6: two kinds of element M may be used in the **Sasaki** compound – see col. 2 lns ln 53.

As to claims 15 and 16: the specific resistance can be adjusted by adjusting the amorphous phase of the alloy as required in **Sasaki** - see col. 5 lns 23-35 and see col. 9 lns 15-19 and col. 17 lns 5-10.

As to claims 17 to 20: the film is formed as a lamina in a magnetic head - col. 1 lns 8-24.

References cited of interest

- **Umetsu et al** (US 6036825) is cited as being of interest showing crystalline structure to be controlled by oxygen addition col. 4 lns 21-25, col. 33-35, col. 13 lns 2-15 to induce a body centered cubic structure (in the instant claims "*bcc*") crystalline structure and note soft magnetic layer composition formulation at col. 3 lns 6-12, col. 5 lns 53-60 the alloy in col. 1 lns 6-8, col. 2 lns 42- 54, col. 4 lns 21-68, col. 6 lns 10-26, and *cf.* oxides used and the results in Table 1.
- **Kamiguchi et al** (US 6303218) is cited as being of interest showing oxides controlling crystal growth. A FeO layer is formed for crystalline growth of a soft magnetic film.
- **Honda et al** (US 5851643) is cited as being of interest showing the desirability of having a fine bcc grain structure for a soft magnetic layer.
- **Kobayashi et al** (US 5290629) is cited as being of interest showing addition of an oxide to control grain growth of a soft magnetic layer.

Art Unit: 1773

CONCLUSION

The claims are:

- Restriction has been required.
- No claim has been allowed.
- No Information Disclosure Statement has been received.

INQUIRES

Any inquiry concerning this communication from the examiner should be directed to examiner Louis Falasco, Ph.D. whose telephone number is 703.305-6974. The examiner can normally be reached M-F 9:30 AM - 6:00 PM.

- If attempts to reach the examiner are unsuccessful, the examiner's supervisor, Paul Thibodeau may be reached at 703.308-2367.
- The Fax phone numbers for the organization where this application or proceeding is assigned are: 703.872-9310 for regular communications and 703.872-9311 for After Final communications.
- An inquiry of a general nature or relating to status of this application or proceeding should be directed to the TC 1700 receptionist whose telephone number is 703.308-0651.


LF
2/03


STEVAN A. RESAN
PRIMARY EXAMINER